SYNTHESIS AND CHARACTERIZATION OF LITHIUM – SUBSTITUTED OF MAGNESIUM OXIDE

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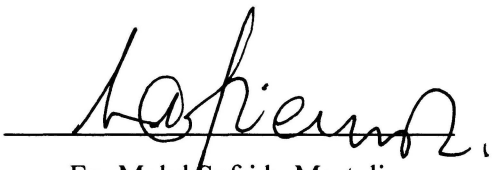
This Final Year Project Report entitled "**Synthesis and Characterization of Lithium – Substituted of Magnesium Oxide**" was submitted by Siti Nur Hazlinda Hasbu, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, was approved by



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ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF LITHIUM – SUBSTITIED OF MAGNESIUM OXIDE

Lithium substituted of magnesium oxide compounds were prepared via sol-gel method using magnesium acetate tetrahydrate and lithium acetate dehydrate as starting materials and oxalic acid as gelating agent. Five different composition of lithium substituted magnesium oxide; $Li_{0.2}Mg_{0.9}O$, $Li_{0.4}Mg_{0.8}O$, $Li_{0.6}Mg_{0.7}O$, $Li_{0.8}Mg_{0.6}O$ and $Li_{1.0}Mg_{0.5}O$ were prepared. The powder obtained was annealed at 950°C for 24 and 36 hours. The characterizations of these compounds were analyzed by using Thermal Gravimetric Analyzer, X-Ray Diffractometer and Scanning Electron Microscopy. The thermal study of magnesium oxide showed the temperature for stable formation of MgO was 500 °C and above. The results showed that, at 950 °C for 24 hours, only three different compositions of substituted compounds were accomplished, which were $Li_{0.2}Mg_{0.9}O$, $Li_{0.4}Mg_{0.8}O$ and $Li_{0.6}Mg_{0.7}O$. By increasing the annealing time into 36 hours for the same annealing temperature, pure products of $Li_{0.8}Mg_{0.6}O$ and $Li_{1.0}Mg_{0.5}O$ were obtained with other compositions except for $Li_{0.4}Mg_{0.8}O$. The morphology of MgO and their substituted MgO were changed from flower-like into rock-like by increasing the amount of lithium ion in the metal oxide matrix.